

Flame Retardant Alternatives

Proprietary K: Aryl phosphate

Hazard Review

Proprietary K: Aryl phosphate
Existing Data Summary Table – Human Health Endpoints

✓ = Endpoint characterized by existing data * = Data available but not adequate ✗ = Endpoint not applicable

As noted in this key, a check mark indicates that an endpoint was adequately characterized by existing studies. It does not indicate a positive or negative result for that particular endpoint.

<i>Acute Toxicity</i>	
Oral	
Dermal	
Inhalation	
Eye irritation	
Dermal irritation	
Skin sensitization	
<i>Subchronic Toxicity</i>	
28-Day oral	
90-Day oral	
Combined repeated dose with reproduction/developmental toxicity screen	
21/28-Day dermal	
90-Day dermal	
90-Day inhalation	
<i>Reproductive Toxicity</i>	
Reproduction/developmental toxicity screen	
Combined repeated dose with reproduction/developmental toxicity screen	
Reproduction and fertility effects	

<i>Developmental Toxicity</i>	
Reproduction/developmental toxicity screen	
Combined repeated dose with reproduction/developmental toxicity screen	
Prenatal developmental	
<i>Chronic Toxicity</i>	
Chronic toxicity (two species)	
Combined chronic toxicity/carcinogenicity	
<i>Carcinogenicity</i>	
Carcinogenicity (rat and mouse)	
Combined chronic toxicity/carcinogenicity	

<i>Neurotoxicity</i>	
Acute and 28-day delayed neurotoxicity of organophosphorus substances (hen)	
Neurotoxicity screening battery (adult)	
Developmental neurotoxicity	
Additional neurotoxicity studies	
<i>Immunotoxicity</i>	
Immunotoxicity	
<i>Genotoxicity</i>	
Gene mutation in vitro	
Gene mutation in vivo	
Chromosomal aberrations in vitro	
Chromosomal aberrations in vivo	
DNA damage and repair	
Other	

Proprietary K: Aryl phosphate
Existing Data Summary Table – Properties, Fate, and Ecotoxicity

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As noted in this key, a check mark indicates that an endpoint was adequately characterized by existing studies. It does not indicate a positive or negative result for that particular endpoint.

P/Chem Properties		Environmental Fate		Ecotoxicity	
Water solubility		Bioconcentration		Aquatic Toxicity	
Octanol/water partition coefficient		Fish		Fish acute LC50	
Oxidation/reduction		Daphnids		Daphnia acute EC50	
Melting point		Green algae		Mysid shrimp acute LC50	
Boiling point		Oysters		Green algae EC50, NOAEC, LOAEC	
Vapor pressure		Earthworms		Fish chronic NOAEC, LOAEC	
Odor		Metabolism in fish		Daphnia chronic NOAEC, LOAEC	
Oxidation/reduction chemical incompatibility		Degradation and Transport		Mysid shrimp chronic NOAEC, LOAEC	
Flammability		Photolysis, atmosphere		Terrestrial Organism Toxicity	
Explosivity		Photolysis, water		Bird LD50 (two species)	
Corrosion characteristics		Photolysis in soil		Bird LC50 (two species)	
pH		Aerobic biodegradation		Bird reproduction	
UV/visible absorption		Anaerobic biodegradation		Earthworm subchronic EC50, LC50, NOAEC, LOAEC	
Viscosity		Porous pot test			
Density/relative density/bulk density		Pyrolysis			
Dissociation constant in water		Hydrolysis as a function of pH			
Henry's Law constant		Sediment/water biodegradation			
		Soil biodegradation w/ product identification			
		Indirect photolysis in water			
		Sediment/soil adsorption/desorption			

Chemical Identity

Proprietary K: Aryl phosphate
CAS
MF
MW
SMILES

Human Health Endpoints

ACUTE TOXICITY

Conclusion:

No available acute toxicity data.

Basis for Conclusion:

No acute toxicity studies were located that addressed the endpoints in the guidelines listed below.

- **Acute Oral Toxicity (OPPTS Harmonized Guideline 870.1100; OECD Guidelines 425, 420, 423, 401)**
- **Acute Dermal Toxicity (OPPTS Harmonized Guideline 870.1200; OECD Guideline 402)**
- **Acute Inhalation Toxicity (OPPTS Harmonized Guideline 870.1300 (OECD Guideline 403)**
- **Acute Eye Irritation (OPPTS Harmonized Guideline 870.2400; OECD Guideline 405)**
- **Acute Dermal Irritation (OPPTS Harmonized Guideline 870.2500; OECD Guideline 404)**

Skin Sensitization (OPPTS Harmonized Guideline 870.2600; OECD Guideline 429)

Conclusion:

The skin sensitization endpoint is not satisfied.

Basis for Conclusion:

No studies were located that followed or were similar to the guideline listed above or otherwise addressed skin sensitization.

SUBCHRONIC TOXICITY

Conclusion:

No available subchronic toxicity data.

Basis for Conclusion:

No pertinent studies were located that addressed the subchronic toxicity endpoints in the guidelines listed below.

Subchronic Oral Toxicity (28-day, 90-day, or combined with reproductive/developmental)

- **Repeated Dose 28-Day Oral Toxicity in Rodents (OPPTS Harmonized Guideline 870.3050; OECD Guideline 407)**
- **90-Day Oral Toxicity in Rodents (OPPTS Harmonized Guideline 870.3100; OECD Guideline 408),**
- **Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test (OPPTS Harmonized Guideline 870.3650; OECD Guideline 422), respectively.**

Subchronic Dermal Toxicity (21/28-day or 90-day).

- **21/28-Day Dermal Toxicity (OPPTS Harmonized Guideline 870.3200 (OECD Guideline 410)**
- **90-Day Dermal Toxicity (OPPTS Harmonized Guideline 870.3250; OECD Guideline 411)**

Subchronic Inhalation Toxicity (90 day)

- **90-Day Inhalation Toxicity (OPPTS Harmonized Guideline 870.3465; OECD Guideline 413)**

REPRODUCTIVE TOXICITY

Conclusion:

No available reproductive toxicity data.

Basis for Conclusion:

No pertinent studies were located that addressed the reproductive toxicity endpoints in the guidelines listed below.

- **Reproduction/Developmental Toxicity Screening (OPPTS Harmonized Guideline 870.3550; OECD Guideline 421)**
- **Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test (OPPTS Harmonized Guideline 870.3650; OECD Guideline 422)**

- **Reproduction and Fertility Effects (OPPTS Harmonized Guideline 870.3800; OECD Guideline 416)**

DEVELOPMENTAL TOXICITY

Conclusion:

No available developmental toxicity data.

Basis for Conclusion:

No pertinent studies were located that addressed the developmental toxicity endpoints in the guidelines listed below.

- **Prenatal Developmental Toxicity Study (OPPTS Harmonized Guideline 870.3700; OECD Guideline 414)**
- **Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test (OPPTS Harmonized Guideline 870.3650; OECD Guideline 422)**
- **Reproduction/Developmental Toxicity Screening (OPPTS Harmonized Guideline 870.3550; OECD Guideline 421)**

CHRONIC TOXICITY

Conclusion:

No available chronic toxicity data.

Basis for Conclusion:

No pertinent studies were located that addressed the chronic toxicity endpoints in the guidelines listed below.

- **Chronic Toxicity (OPPTS Harmonized Guideline 870.4100; OECD Guideline 452)**
- **Combined Chronic Toxicity/Carcinogenicity (OPPTS Harmonized Guideline 870.4300; OECD Guideline 453)**

CARCINOGENICITY

Conclusion:

No available carcinogenicity data.

Basis for Conclusion:

No pertinent studies were located that addressed the carcinogenicity endpoints in the guidelines listed below.

- **Carcinogenicity (OPPTS Harmonized Guideline 870.4200; OECD Guideline 451)**
- **Combined Chronic Toxicity/Carcinogenicity (OPPTS Harmonized Guideline 870.4300; OECD Guideline 453)**

NEUROTOXICITY

Conclusion:

No available neurotoxicity data.

Basis for Conclusion:

No neurotoxicity studies were located that addressed the endpoints in the guidelines listed below.

Delayed Neurotoxicity

- **Acute and 28-Day Delayed Neurotoxicity of Organophosphorus Substances (OPPTS Harmonized Guideline 870.6100; OECD Guideline 418, 419)**

Neurotoxicity (Adult)

- **Neurotoxicity Screening Battery (OPPTS Harmonized Guideline 870.6200; OECD Guideline 424)**

Developmental Neurotoxicity

- **Developmental Neurotoxicity: Developmental Neurotoxicity Study (OPPTS Harmonized Guideline 870.6300)**

IMMUNOTOXICITY

Conclusion:

No available immunotoxicity data.

Basis for Conclusion:

No immunotoxicity studies were located that addressed the endpoints in the guidelines listed below.

- **Immunotoxicity (OPPTS Harmonized Guideline 870.7800)**

GENOTOXICITY

Conclusion:

No available genotoxicity data.

Basis for Conclusion:

No genotoxicity studies relevant to the below categories or to other types of genotoxic effects were located.

Gene Mutation in Vitro

Gene Mutation in Vivo

Chromosomal Aberrations in Vitro

Chromosomal Aberrations in Vivo

DNA Damage and Repair

Ecotoxicity

Acute Toxicity to Aquatic Organisms

Conclusion:

No available acute toxicity data for fish, aquatic invertebrates, and algae.

Basis for Conclusion:

No pertinent acute toxicity studies with fish, aquatic invertebrates, or algae were located that addressed the endpoints in the guidelines listed below.

- **Acute Toxicity to Freshwater and Marine Fish (OPPTS Harmonized Guideline 850.1075; OECD Guideline 203)**
- **Acute Toxicity to Freshwater Invertebrates (OPPTS Harmonized Guideline 850.1010; OECD Guideline 202)**
- **Acute Toxicity to Marine/Estuarine Invertebrates (OPPTS Harmonized Guideline 850.1035)**
- **Algal Toxicity (OPPTS Harmonized Guideline 850.5400; OECD Guideline 201)**

Chronic Toxicity to Aquatic Organisms

Conclusion:

No available chronic toxicity data for fish and aquatic invertebrates.

Basis for Conclusion:

No pertinent chronic toxicity studies with fish or aquatic invertebrates were located that addressed the endpoints in the guidelines listed below.

- **Chronic Toxicity to Freshwater and Marine Fish (OPPTS Harmonized Guideline 850.1400; OECD Guideline 210)**
- **Chronic Toxicity to Freshwater Invertebrates (OPPTS Harmonized Guideline 850.1300; OECD Guideline 211)**
- **Chronic Toxicity to Marine/Estuarine Invertebrates (OPPTS Harmonized Guideline 850.1350)**

Acute and Subchronic Toxicity to Terrestrial Organisms

Conclusion:

No available acute and subchronic toxicity data for terrestrial organisms.

Basis for Conclusion:

No pertinent acute oral, acute dietary, or reproductive toxicity studies with birds and no subchronic toxicity studies with earthworms were located that addressed the endpoints in the guidelines listed below.

- **Acute Oral Toxicity in Birds (OPPTS Harmonized Guideline 850.2100)**
- **Acute Dietary Toxicity in Birds (OPPTS Harmonized Guideline 850.2200; OECD Guideline 205)**
- **Reproductive Toxicity in Birds (OPPTS Harmonized Guideline 850.2300; OECD Guideline 206)**
- **Earthworm Subchronic Toxicity (OPPTS Harmonized Guideline 850.6200; OECD Guideline 207)**

Physical/Chemical Properties

Proprietary K: Aryl phosphate

CAS

MF

MW

SMILES

Water Solubility (mg/L): No data

Log K_{ow}: No data

Oxidation/Reduction: No data

Melting Point: No data

Vapor Pressure (torr): No data

Odor: No data

Oxidation/Reduction Chemical Incompatibility: No data

Flammability: No data

Explosivity: No data

Corrosion Characteristics: No data

pH: No data

UV/VIS Absorption: No data

Viscosity: No data

Density/Relative Density/Bulk Density: No data

Dissociation Constant in Water: No data

Henry's Law Constant: No data

Environmental Fate

Bioconcentration

Fish: No data

Daphnids: No data

Green Algae: No data

Oysters: No data

Earthworms: No data

Fish Metabolism: No data

Degradation

Photolysis in the Atmosphere: No data

Photolysis in Water: No data

Photolysis in Soil: No data

Aerobic Biodegradation: No data

Anaerobic Biodegradation: No data

Porous Pot Test: No data

Pyrolysis: No data

Hydrolysis as a Function of pH: No data

Sediment/Water Biodegradation: No data

Soil Biodegradation with Product Identification: No data

Indirect Photolysis in Water: No data

Sediment/Soil Adsorption/Desorption: No data